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09/772,664	01/30/2001	Kazuhito Ohashi	1232-4676	2213

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EXAMINER

THOMPSON, JAMES A

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 12/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/772,664	Applicant(s) OHASHI, KAZUHITO	
	Examiner James A. Thompson	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2006 and 26 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 37-40 and 48-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-40 and 48-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30 August 2006 has been entered.

### *Response to Arguments*

2. Applicant's arguments filed 28 November 2006 have been fully considered but they are not persuasive. While it is true that the combination of Arimoto (US Patent 5,371,613), Orito (US Patent 6,072,912) and Sawada (US Patent 5,912,992) do not teach the presently amended limitations "said first level is a maximum of signal levels read out via the plurality of output channels when said white member is scanned, and said second reference level is a minimum of signal levels read out via the plurality of output channels when said reference density member is scanned", the combination of Arimoto, Orito, Sawada and Irie (US Patent 5,644,409) does teach this feature of the presently amended claims. The combination of Arimoto, Orito, Sawada and Irie is set forth in detail below.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 37-40, 48-55, 57-58 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613), Orito (US Patent 6,072,912), Sawada (US Patent 5,912,992) and Irie (US Patent 5,644,409).

**Regarding claim 37:** Arimoto discloses an image sensing apparatus (figure 2 of Arimoto). Figure 1 and figure 3 of Arimoto show further details of said apparatus (column 3, lines 3-5 and lines 8-10 of Arimoto).

Arimoto further discloses an image sensor (figure 1(210) of Arimoto) which reads out image signals (column 4, lines 56-58 of Arimoto) from a plurality of photoreceptive pixels (CCD) via an output channel (column 4, lines 53-56 of Arimoto); a reference level acquisition unit (figure 1(106(portion)) of Arimoto) adapted to acquire a first reference level based on the image signals output from said output channel when said image sensor reads a white member (column 6, lines 44-49 of Arimoto), and acquire a second reference level based on the image signal output from said output channel when said image sensor reads a reference density member having a predetermined density of halftone (column 6, lines 26-34 of Arimoto); and an adjustment unit (figure 1(106(portion)) of Arimoto) adapted to adjust levels of the image signals output from said output channel so as to substantially correspond with said first reference level when said image sensor reads said white member (column 7, lines 48-55 of Arimoto), and adjust levels of the image output from said output channel so as to substantially correspond with said second reference level when said image sensor reads said reference density member (column 9, lines 52-56 and column 10, lines 1-4 of Arimoto).

Arimoto further discloses that the signal level value for said second reference member (figure 3(301P) of Arimoto) is uniform and unchanging over the area of said reference member (column 6, lines 38-43 of Arimoto). Therefore, said second reference level is a minimum of signal levels read out when said reference density member is scanned, since said minimum is equal to said uniform signal level value.

The reference level acquisition unit and adjustment unit each correspond to the portion of the physically embodied computer routines that causes the computer to perform the functions of said reference level acquisition unit and said adjustment unit.

Arimoto does not disclose expressly that said image sensor separately reads out image signals from a plurality of photo-receptive pixels via a plurality of output channels; and that there are a plurality of adjustment units, respectively corresponding to said plurality of output channels, each of which separately perform the functions of said adjustment unit taught by Arimoto. Since two separate reference levels are used by said adjusting unit to adjust the image data, it would be reasonable to assume that said adjustment unit adjust levels of the image signals output from said output channel so as to substantially correspond with a level obtained by interpolating between said first and said second reference levels when said image sensor reads an image having a density other than the density of said white member and said reference density member. However, Arimoto does not disclose expressly that said adjustment unit adjust levels of the image signals output from said output channel so as to substantially correspond with a level obtained by interpolating between said first and said second reference levels when said image sensor reads an image having a density other than the density of said white member and said reference density

member, wherein said first level is a maximum of signal levels read out via the plurality of output channels when said white member is scanned, and said second reference level is a minimum of signal levels read out via the plurality of output channels when said reference density member is scanned.

Orito discloses separately outputting image signals of a plurality of photoreceptive pixels via a plurality of output channels (column 5, lines 9-14 of Orito). By transferring the image data in parallel (column 5, lines 9-14 of Orito), a plurality of output channels are used to separately output image signal of the plurality of photoreceptive pixels.

Orito further discloses a plurality of adjustment units, respectively corresponding to said plurality of output channels, each adapted to adjust levels of the image signals output from said output channels (column 6, lines 20-26 of Orito). Tone levels are adjusted to produce tone data, black level data, and white level data, which are output separately.

Arimoto and Orito are combinable because they are from the same field of endeavor, namely correcting digital tone data in digital image scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to process and adjust the image data based on said reference member, as taught by Arimoto, using parallel data transfer and to adjust said tone data using a plurality of adjustment units respectively corresponding to the output units used for the parallel data transfer, as taught by Orito. Therefore, there would be a plurality of output terminals accessed by said reference level acquisition unit and said adjustment unit, and said second reference level would be read out via the plurality of output channels. The suggestion for doing so would have been that parallel data transfer is a standard form of communication interface (column 5, lines 8-14 of Orito). Therefore, it would have been obvious to combine Orito with Arimoto.

The combination of Arimoto and Orito does not disclose expressly that said adjustment unit adjust levels of the image signals output from said output channel so as to substantially correspond with a level obtained by interpolating between said first and said second reference levels when said image sensor reads an image having a density other than the density of said white member and said reference density member, wherein said first level is a maximum of signal levels read out via the plurality of output channels when said white member is scanned.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4, lines 25-28 of Sawada).

The combination of Arimoto and Orito is combinable with Sawada because they are from the same field of endeavor, namely digital image data processing and correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use interpolation to

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interpolate image data values when said image data is between predetermined points, as taught by Sawada, said image data values being the image signal levels output from said plurality of output channels and said interpolation being performed by said adjustment data acquisition unit to match said levels that are between said first and second predetermined levels. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with the combination of Arimoto and Orito.

The combination of Arimoto, Orito and Sawada does not disclose expressly that said first level is a maximum of signal levels read out via the plurality of output channels when said white member is scanned.

Irie discloses using the maximum (WMAX2) of the obtained signal levels (column 7, lines 26-30 of Irie) for performing white level correction (column 8, lines 22-25 of Irie).

The combination of Arimoto, Orito and Sawada is combinable with Irie because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the maximum of the obtained signal levels, as taught by Irie, said signal level read out via the plurality of output channels taught by the combination of Arimoto and Orito. The motivation for doing so would have been to be able to perform white level correction for a case when the white member is not dirty as a whole, but partially dirty (column 8, lines 23-25 of Irie). Therefore, it would have been obvious to combine Irie with the combination of Arimoto, Orito and Sawada to obtain the invention as specified in claim 37.

**Regarding claim 38:** Arimoto discloses that said reference density member (figure 3(301P) of Arimoto) is provided within the image sensing apparatus (column 6, lines 22-26 of Arimoto).

**Regarding claim 39:** Arimoto discloses a platen (figure 3(15) of Arimoto) for placing an original to be read (column 5, lines 40-43 of Arimoto), wherein said image sensor reads said reference density member (column 6, lines 41-43 of Arimoto) in a case where said reference density member is placed on said platen (column 6, lines 26-30 of Arimoto).

**Regarding claim 40:** Arimoto discloses that at least one of the first and second reference levels is set in advance (column 6, lines 26-31 of Arimoto). The reference patch (figure 3(301P) of Arimoto) is set to a predetermined level (0.1) (column 6, lines 26-31 of Arimoto) and used as a reference level for the shading correction (column 6, lines 42-43 of Arimoto).

**Regarding claim 48:** Arimoto discloses that said adjustment units adjust maximum levels of image signals so that they become maximum levels after adjustment (column 10, lines 5-10 of Arimoto). After said adjustment by said adjustment units (column 9, lines 52-56 and column 10, lines 1-4 of

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Arimoto), the output pixel values that are set to 255 (the maximum value for eight bits) based on the normalization with respect to the standard white plate density measurement (column 10, lines 5-10 of Arimoto).

**Regarding claim 49:** The combination of Arimoto and Orito does not disclose expressly that the levels between said first and second reference levels are interpolated by a straight line.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4, lines 25-28 of Sawada), said interpolation being linear interpolation (column 4, lines 30-31 of Sawada), and thus interpolation by a straight line.

The combination of Arimoto and Orito is combinable with Sawada because they are from the same field of endeavor, namely image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use linear interpolation to interpolate image data values when said image data is between predetermined points, as taught by Sawada. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with the combination of Arimoto and Orito to obtain the invention as specified in claim 49.

**Regarding claim 50:** The combination of Arimoto and Orito does not disclose expressly that the levels between said first and second predetermined levels are interpolated by a curve.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4, lines 25-28 of Sawada), said interpolation being performed using a curve (column 4, lines 31-34 of Sawada).

The combination of Arimoto and Orito is combinable with Sawada because they are from the same field of endeavor, namely image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use curve interpolation to interpolate image data values when said image data is between predetermined points, as taught by Sawada. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with the combination of Arimoto and Orito to obtain the invention as specified in claim 50.

**Regarding claim 51:** The combination of Arimoto and Orito does not disclose expressly that interpolation is performed by operation.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4, lines 25-28 of Sawada), said interpolation being performed by operations, such as linear interpolation operations and curve interpolation operations (column 4, lines 30-34 of Sawada).

The combination of Arimoto and Orito is combinable with Sawada because they are from the same field of endeavor, namely image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the interpolation using operations, as taught by Sawada. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with the combination of Arimoto and Orito to obtain the invention as specified in claim 51.

**Regarding claim 52:** Arimoto discloses that said adjustment data is in a form of a look up table (figure 1(112') and column 60-67 of Arimoto).

**Further regarding claim 53:** Orito discloses separately outputting image signals of a plurality of photoreceptive pixels from a plurality of output channels (column 5, lines 9-14 of Orito). Since the image data is transferred in parallel (column 5, lines 9-14 of Orito), there are a plurality of output channels used to separately output image signal of the plurality of photoreceptive pixels. A plurality of output channels is clearly at least two output channels, therefore said plurality of output channels comprises a first output channel and a second output channel. Since there is no particular order to the output of the photoreceptive pixels, then both said first output channel and said second output channel would each output even-numbered photoreceptive pixels, though said first output channel and said second output channel would also output odd-numbered photoreceptive pixels. Thus, said plurality of output channels comprises a first output channel which outputs image signals of even-numbered photoreceptive pixels, and a second output channel which outputs image signals of even-numbered photoreceptive pixels.

**Regarding claim 54:** Arimoto discloses that said image sensor is a linear image sensor (column 4, lines 53-56 of Arimoto).

**Regarding claim 55:** Arimoto discloses that a plurality of said linear image sensors respectively corresponding to a plurality of colors are provided to form a color image sensor (column 19, line 65 to column 20, line 1 of Arimoto).

**Regarding claim 56:** The combination of Arimoto, Orito and Sawada does not disclose expressly that said image sensor is an area image sensor.

Irie discloses an area image sensor (figure 1(1) and column 5, lines 29-32 of Irie).

The combination of Arimoto, Orito and Sawada is combinable with Irie because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use an area image sensor, as taught by Irie, for the image sensor taught by Arimoto. The motivation for doing so would have been to be able to read data two-dimensionally (column 5, lines 31-32 of Irie). Therefore, it would have been obvious to combine Irie



with the combination of Arimoto, Orito and Sawada to obtain the invention as specified in claim 56.

**Regarding claim 57:** Arimoto discloses that each of said plurality of adjustment units includes an amplifier (figure 1(101) of Arimoto) for amplifying the image signal output from the corresponding output channel (column 5, lines 1-2 of Arimoto).

**Regarding claim 58:** Arimoto discloses an A/D converter (figure 1(102) of Arimoto) adapted to convert the image signal output from each of the output channels from an analog signal to a digital signal (column 5, lines 2-3 of Arimoto).

Since the combination of Arimoto and Orito teaches a plurality of output channels, as discussed in the arguments regarding claim 37, the combination of Arimoto and Orito therefore teaches a plurality of A/D converters, each adapted to convert the image signal output from each output channel from an analog to a digital signal. Since there are multiple output channels, multiple A/D converters are required, one for each output channel.

**Regarding claim 60:** Arimoto discloses that said reference density member has at least a portion of uniform density (column 6, lines 37-43 of Arimoto).

5. **Claims 59 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613), Orito (US Patent 6,072,912), Sawada (US Patent 5,912,992), Irie (US Patent 5,644,409), and Usami (US Patent 5,960,110).**

**Regarding claim 59:** The combination of Arimoto, Orito, Sawada and Irie does not disclose expressly that the image sensing apparatus is connected to a printer and said reference density member is printed on said printer.

Usami discloses that the image sensing apparatus is connected to a printer (figure 5(20) and column 7, lines 28-30 of Usami) and a reference output condition, e.g. reference printing density, is printed (column 7, lines 40-43 of Usami).

The combination of Arimoto, Orito, Sawada and Irie is combinable with Usami because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to connect said image sensing apparatus to a printer and print out a reference density, as taught by Usami, said reference density being the density of said reference density member taught by Arimoto. The motivation for doing so would have been to generate predictions for the corrected output conditions (column 7, lines 47-50 of Usami). Therefore, it would have been obvious to combine Usami with the combination of Arimoto, Orito, Sawada and Irie to obtain the invention as specified in claim 59.

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**Further regarding claim 61:** Usami discloses that an image sensing apparatus (figure 5 and column 7, lines 20-23 of Usami) is integrally configured with said printer (figure 5(20) of Usami), since said printer is used to generate the reference images based on the apparatus output conditions (column 7, lines 28-33 of Usami).

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JAT

28 November 2006

James A. Thompson  
Examiner  
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